

Three Phytoseiid Mites from Korea (Acari: Phytoseiidae)

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柳 面玉¹⁾・江原昭三²⁾：韓国産のカブリダニ 3 種について

Abstract: *Phytoseius* (*Phytoseius*) *koreanus* RYU et EHARA, n. sp. was described from Korea. *Amblyseius volgini* WAINSTEIN et BEGLJAROV and *A. quaesitus* WAINSTEIN et BEGLJAROV, previously recorded only from the U.S.S.R. and China, were redescribed based on Korean specimens. *Amblyseius magnus* WU is a synonym of *A. volgini*, and *A. (A.) repletus* WU et LI is a synonym of *A. quaesitus*.

Up to the present, nine species belonging to the mite family Phytoseiidae have been recorded from Korea (LEE, 1961; LEE and RYU, 1989; DENMARK and MUMA, 1989; RYU and EHARA, 1990). In the present paper a new species of *Phytoseius* RIBAGA is described from this country, and two unrecorded Korean species of *Amblyseius* BERLESE are redescribed. The setal nomenclature follows that of CHANT and HANSELL (1971) and ROWELL *et al.* (1978). All measurements are given in micrometers. The type series of the new species is retained in the Department of Biology, College of Natural Sciences, Chonbuk National University.

Phytoseius (*Phytoseius*) *koreanus* RYU et EHARA, n. sp.

(Figs. 1– 8)

Female. Idiosoma 395 long, 261 wide at level of waist: dorsal shield 311 long, 169 wide at level of waist. Dorsal shield rugose. Setae on dorsal shield: j1, j3, z3, Z4, Z5, s4, s6, and r3 stout, strongly serrate, set on tubercles; z4 serrate; the remaining setae short, smooth; s4 and Z5 longer than s6 and Z4; r3 longer than j3, z3, and j1; z3 slightly longer than j3. Peritreme extending to seta j1; peritrematal shield fused anteriorly with dorsal shield. Sternal shield with three pairs of setae; metasternal platelets variable in shape. Ventrianal shield slender, narrower

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than genital shield, concave laterally, with three pairs of preanal setae, sometimes one or two of ZV2 absent on the shield; no preanal pores. Seta JV5 stout, strongly serrate. A pair of very slender, metapodal platelets. Spermatheca as figured. Fixed digit of chelicera with three subapical teeth, one middle tooth, and pilus dentilis; the movable digit unidentate. Chaetotaxic formula:

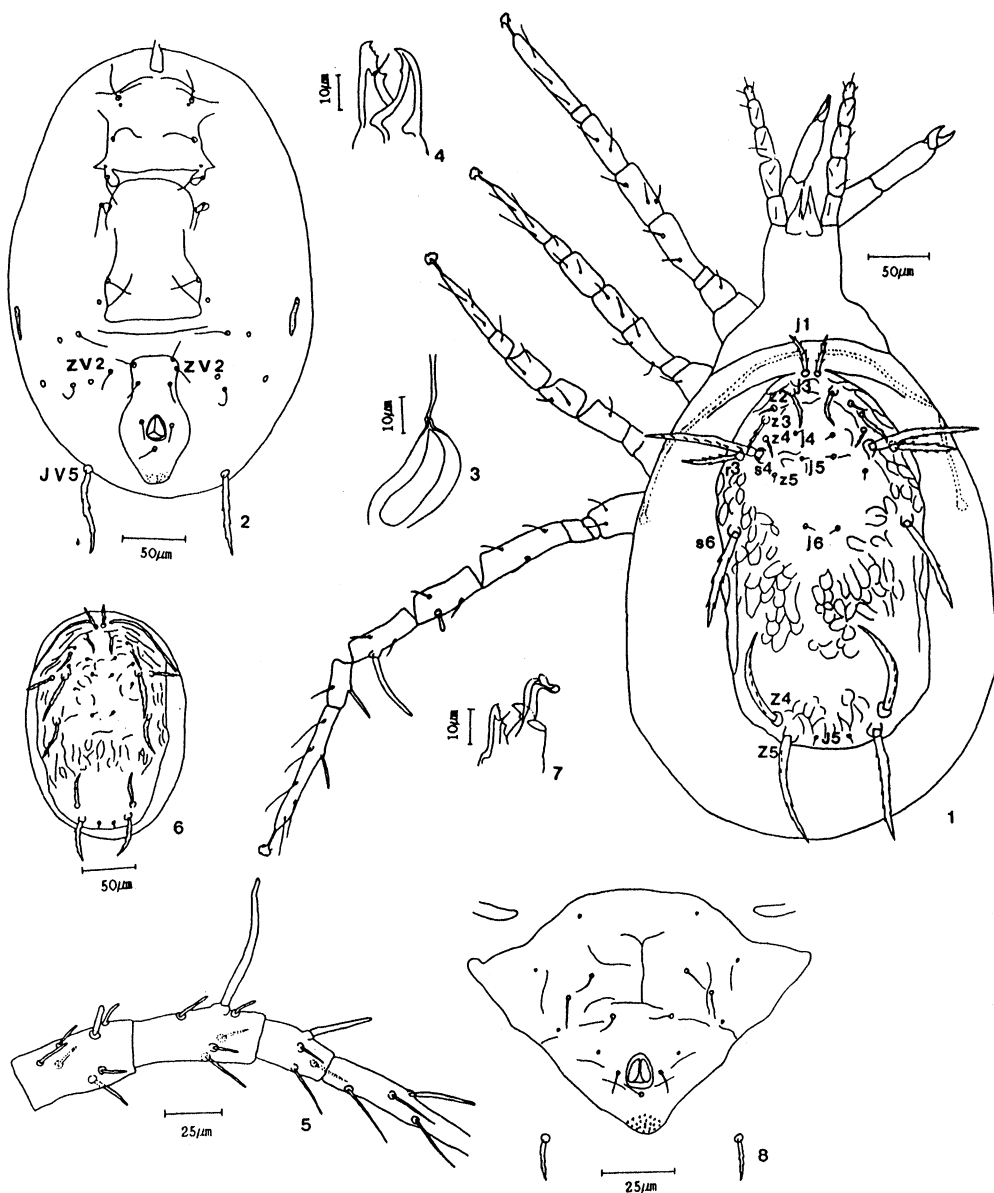


Fig. 1–8 *Phytoseius (Phytoseius) koreanus* RYU et EHARA, n. sp. 1, dorsum (♀); 2, venter of idiosoma (♀); 3, spermatheca; 4, chelicera (♀); 5, genu, tibia, and tarsus of leg IV (♀); 6, dorsum of idiosoma (♂); 7, chelicera (♂); 8, ventrianal shield (♂).

genu II, 2-2/0, 2/0-1; genu III, 1-2/0, 2/0-1. Leg IV with four blunt-ended macrosetae. Lengths of setae¹⁾ (n = 10): j1 33.3 ± 0.6 , j3 30.9 ± 0.7 , j4 7.3 ± 0.3 , j5 6.7 ± 0.2 , j6 7.0 ± 0.3 , j5 8.3 ± 0.4 , z2 12.8 ± 0.6 , z3 34.8 ± 0.5 , z4 20.1 ± 0.9 , z5 6.8 ± 0.2 , Z4 73.6 ± 1.6 , Z5 91.6 ± 2.3 , s4 94.0 ± 2.0 , s6 78.5 ± 2.4 , r3 47.8 ± 0.8 , JV5 61.7 ± 1.3 , macrosetae on leg IV: genu 17.7 ± 0.6 , tibia 61.2 ± 1.9 , basitarsus 32.3 ± 0.8 , telotarsus 31.2 ± 0.5 .

Male. Idiosoma 275 long, 179 wide at level of waist. Peritreme not extending beyond seta j1. Ventrianal shield not fused with peritrematal shield, with three pairs of preanal setae; four pairs of pores. Fixed digit of chelicera with three subapical teeth and pilus dentilis; the movable digit unidentate. Spermatodactyl as figured. Chaetotaxic formula of genera II and III same as for female. Leg IV with four blunt-ended macrosetae. Lengths of setae (n = 10): j1 25.2 ± 0.2 , j3 24.9 ± 0.6 , j4 6.5 ± 0.3 , j5 6.2 ± 0.1 , j6 6.4 ± 0.2 , J5 5.9 ± 0.2 , z2 9.9 ± 0.3 , z3 24.9 ± 0.7 , z4 14.7 ± 0.5 , z5 6.2 ± 0.1 , Z4 34.1 ± 1.3 , Z5 45.9 ± 1.6 , s4 52.5 ± 1.3 , s6 45.5 ± 1.4 , r3 33.3 ± 0.7 , JV5 19.1 ± 0.6 , macrosetae on leg IV: genu 14.7 ± 0.6 , tibia 24.3 ± 1.1 , basitarsus 23.6 ± 0.7 , telotarsus 22.9 ± 0.4 .

Type series. Holotype: ♀, Mujuguchondong, Mt. Tokyu, Muju, Chonbuk, 4-VII-1990 (M.-O. RYU leg.), on *Ulmus davidiana* PLANCH. var. *japonica* (REHD.) NAKAI. Allotype: ♂, data the same as for holotype. Paratypes: 2 ♀♀ & 3 ♂♂, data the same as for holotype; 5 ♀♀ & 5 ♂♂, Mujuguchondong, Mt. Tokyu, Muju, Chonbuk, 16-VIII-1988 (M.-O. RYU leg.), on *Ulmus davidiana* var. *japonica*; 3 ♀♀ & 2 ♂♂, Mujuguchondong, Mt. Tokyu, Muju, Chonbuk, 7-VIII-1988 (M.-O. RYU leg.), on *Styrax obassia* SIEB. et ZUCC.

Remarks. *Phytoseius koreanus* is close to *P. carpineus* WAINSTEIN, 1978 (Primorsky Territory, U.S.S.R.), and *P. qianshanensis* LIANG et KE, 1981 (Liaoning Province, China). However, *P. koreanus* is readily distinguished from the two species by the relative lengths of the dorsal idiosomal setae.

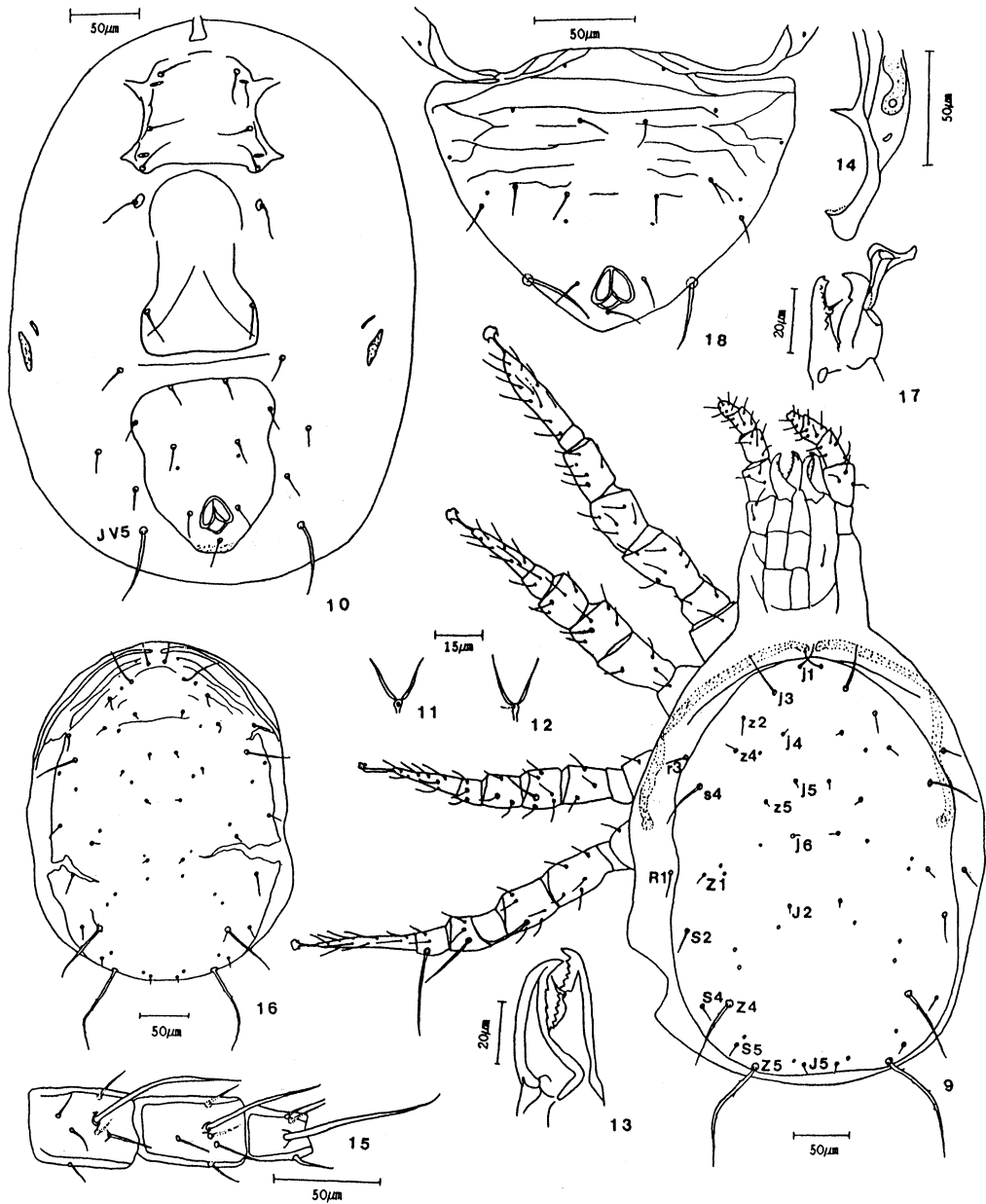
Amblyseius volgini WAINSTEIN et BEGLJAROV
(Figs. 9–18)

Amblyseius volgini WAINSTEIN et BEGLJAROV, 1971, p. 1804, Fig. 2.

Amblyseius magnus WU, 1987, p. 261, Figs. 5–11, *New synonymy*.

Female. Body brown in colour. Idiosoma 427 long, 300 wide at level of R1; dorsal shield 389 long, 238 wide at level of waist. Dorsal shield smooth, with at least seven pairs of small pores. Setae on dorsal shield: Z5 the longest, barbed; Z4 slightly barbed; the remaining setae smooth; s4 longer than j3; S2 longer than Z1; z2 longer than z4. Setae r3 and R1 on interscutal membrane, smooth. Peritreme extending to between setae j1; peritrematal shield fused anteriorly with dorsal shield, with a posterior transverse suture. Sternal shield with three pairs of setae; metasternal platelets much longer than wide. Ventrianal shield longer than wide, wider than

1) Mean \pm S.E.



Figs. 9–18 *Amblyseius volgini* WAINSTEIN et BEGLJAROV. 9, dorsum (♀); 10, venter of idiosoma (♀); 11–12, spermatheca; 13, chelicera (♀); 14, peritrematal shield (♀); 15, genu, tibia, and basitarsus of leg IV (♀); 16, dorsum of idiosoma (♂); 17, chelicera (♂); 18, ventrianal shield (♂).

genital shield, with lateral margins slightly concave. Three pairs of preanal setae on ventrianal shield; a pair of pores behind and very slightly mesad of posterior preanals. Seta JV5 smooth. Two pairs of slender metapodal platelets, the posterior pair much larger. Spermatheca as figured. Fixed digit of chelicera multidentate, with pilus dentilis; the movable digit with three teeth. Chaetotaxic formula: genu II, 2-2/0, 2/0-1; genu III, 1-2/1, 2/0-1. Leg IV with three tapering macrosetae; genua II and III with a macroseta. Lengths of setae ($n=10$): j1 23.8 ± 0.7 , j3 40.1 ± 0.3 , j4 7.5 ± 0.2 , j5 6.6 ± 0.2 , j6 7.3 ± 0.2 , J2 7.1 ± 0.2 , J5 9.8 ± 0.2 , z2 19.0 ± 0.7 , z4 13.8 ± 0.8 , z5 5.9 ± 0.2 , Z1 9.9 ± 0.3 , Z4 65.7 ± 0.9 , Z5 101.2 ± 1.5 , s4 46.0 ± 0.5 , S2 21.8 ± 0.8 , S4 11.9 ± 0.6 , S5 10.5 ± 0.3 , r3 18.6 ± 0.3 , R1 18.7 ± 0.6 , JV5 52.4 ± 0.6 , macrosetae on leg IV: genu 65.9 ± 1.4 , tibia 52.1 ± 1.3 , basitarsus 72.8 ± 1.0 .

Male. Idiosoma 335 long, 250 wide at level of R1. Setae r3 and R1 on dorsal shield. Peritreme extending to between setae j1. Ventrianal shield reticulate, fused with peritrematal shield; four pairs of preanal setae; five pairs of preanal pores. Chelicera with seven teeth and pilus dentilis on fixed digit; the movable digit unidentate. Spermatodactyl as figured. Chaetotaxic formula of genua II and III same as for female. Leg IV with three tapering macrosetae. Lengths of setae ($n=6$): j1 21.8 ± 0.8 , j3 39.8 ± 1.3 , j4 6.8 ± 0.4 , j5 6.7 ± 0.3 , j6 7.5 ± 0.2 , J2 7.0 ± 0.4 , J5 8.7 ± 0.2 , z2 13.8 ± 0.9 , z4 ($n=5$) 12.8 , z5 5.8 ± 0.4 , Z1 9.3 ± 0.4 , Z4 61.7 ± 1.4 , Z5 88.5 ± 2.5 , s4 43.8 ± 0.9 , S2 20.2 ± 0.8 , S4 12.0 ± 0.4 , S5 11.0 ± 0.4 , r3 17.7 ± 0.5 , R1 16.5 ± 0.3 , JV5 40.3 ± 1.9 , macrosetae on leg IV: genu 53.2 ± 1.2 , tibia 38.5 ± 1.2 , basitarsus 60.3 ± 2.4 .

Specimens examined. One ♀, Chonbuk University campus, Chonju, Chonbuk, 6-VIII-1987 (M.-O. RYU leg.), on *Chamaecyparis obtusa* SIEB. et ZUCC.; 1 ♀, Chonbuk University campus, Chonju, Chonbuk, 6-VIII-1987 (M.-O. RYU leg.), on *Juniperus chinensis* L.; 1 ♀ & 1 ♂, Chonbuk University campus, Chonju, Chonbuk, 5-VIII-1987 (M.-O. RYU leg.), on *Cedrus deodara* (ROXB.) LOUD.; 5 ♀♀ & 1 ♂, Mujuguchondong, Mt. Tokyu, Muju, Chonbuk, 7-VIII-1988 (M.-O. RYU leg.), on *Abies koreana* WILSON; 1 ♀, Kongju, Chungnam, 14-VIII-1987 (M.-O. RYU leg.), on *Abies holophylla* MAXIM.; 1 ♂, Mujuguchondong, Mt. Tokyu, Muju, Chonbuk, 8-VIII-1988 (M.-O. RYU leg.), on *Abies holophylla*; 2 ♀♀, Mt. Seonun, Kochang, Chonbuk, 19-VIII-1988 (M.-O. RYU leg.), on *Pinus densiflora* SIEB. et ZUCC.; 1 ♂, Mujuguchondong, Mt. Tokyu, Muju, Chonbuk, 16-VIII-1989 (M.-O. RYU leg.), on *Abies koreana*; 2 ♀♀ & 2 ♂♂, Mt. Naejang, Chongup, Chonbuk, 1-VIII-1990 (M.-O. RYU leg.), on *Abies holophylla*.

Remarks. Prior to the present paper *Amblyseius volgini* was recorded from the U.S.S.R. (Primorsky Territory) and China (Northeast China, as *magnus*).

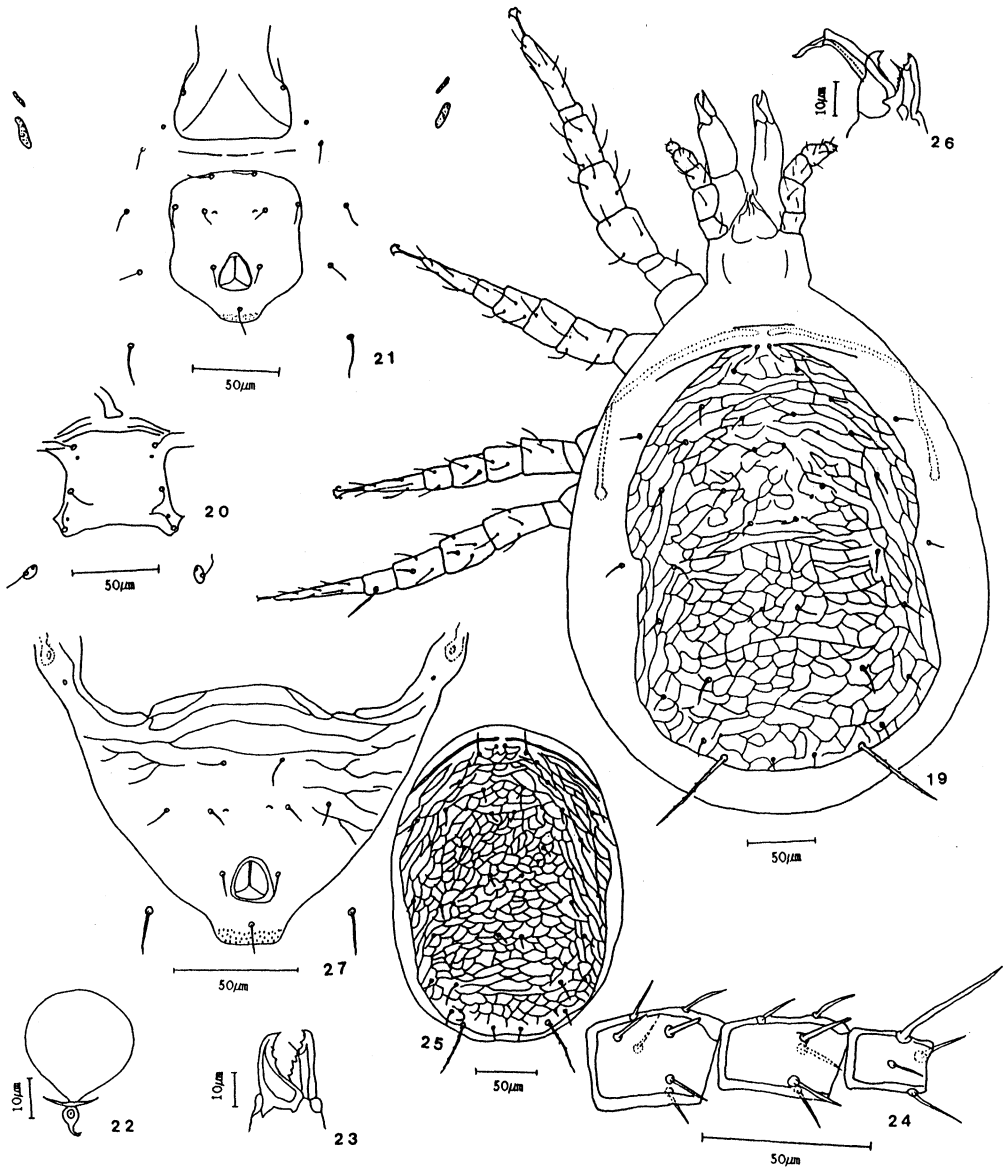
Amblyseius quaesitus WAINSTEIN et BEGLJAROV

(Figs. 19–27)

Amblyseius quaesitus WAINSTEIN et BEGLJAROV, 1971, p. 1810, Fig. 7.

Amblyseius (*Amblyseius*) *repletus* WU et LI, 1985, p. 268, Figs. 1–5. *New synonymy.*

Female. Idiosoma 350 long, 253 wide at level of R1; dorsal shield 313 long, 200 wide at level of waist. Dorsal shield imbricate, with at least four pairs of small pores. Setae on dorsal shield: Z5 the longest, barbed; the remaining setae much smaller, smooth. Setae r3 and R1 on interscutal membrane, smooth. Peritreme extending to seta j1; peritrematal shield fused anteriorly



Figs. 19–27 *Amblyseius quaesitus* WAINSTEIN et BEGLJAROV. 19, dorsum (♀); 20, sternal shield (♀); 21, posterior ventral surface (♀); 22, spermatheca; 23, chelicera (♀); 24, genu, tibia, and basitarsus of leg IV (♀); 25, dorsum of idiosoma (♂); 26, chelicera (♂); 27, ventrianal shield (♂).

with dorsal shield, with a posterior transverse suture. Sternal shield with posterior margin straight or slightly concave, with three pairs of setae, Metasternal platelets much longer than wide. Ventrianal shield approximately pentagonal, wider than genital shield; the lateral margins slightly concave; a pair of pores in a transverse line with the posterior preanals. Seta JV5 smooth. Two pairs of metapodal platelets, the posterior pair much larger. Spermatheca as figured. Chelicera with eight teeth and pilus dentilis on fixed digit; the movable digit with two teeth. Chaetotaxic formula: genu II, 2-2/0, 2/0-1; genu III, 1-2/1, 2/0-1. Leg IV with three blunt macrosetae. Lengths of setae ($n=10$): j1 19.4 ± 0.3 , j3 19.0 ± 0.3 , j4 13.2 ± 0.4 , j5 14.2 ± 0.3 , j6 13.9 ± 0.5 , J2 16.4 ± 0.5 , J5 10.3 ± 0.3 , z2 16.1 ± 0.4 , z4 17.4 ± 0.4 , z5 12.9 ± 0.4 , Z1 16.3 ± 0.5 , Z4 24.6 ± 0.6 , Z5 72.6 ± 1.1 , s4 19.9 ± 0.4 , S2 17.6 ± 0.5 , S4 15.9 ± 0.5 , S5 15.6 ± 0.6 , r3 16.5 ± 0.4 , R1 15.5 ± 0.4 , JV5 25.5 ± 0.9 , macrosetae on leg IV: genu 10.8 ± 0.2 , tibia 16.7 ± 0.3 , basitarsus 31.7 ± 0.7 .

Male. Idiosoma 267 long, 190 wide at level of R1. Setae r3 and R1 on dorsal shield. Peritreme extending to seta j1. Ventrianal shield fused with peritrematal shield, with three pairs of preanal setae; a pair of pores in a transverse line with the posterior preanals. Chelicera with seven teeth and pilus dentilis on fixed digit; the movable digit unidentate. Spermatodactyl as figured. Chaetotaxic formula of genua II and III same as for female. Lengths of setae ($n=10$): j1 17.7 ± 0.3 , j3 19.7 ± 0.4 , j4 10.5 ± 0.2 , j5 10.1 ± 0.3 , j6 10.7 ± 0.3 , J2 11.4 ± 0.4 , J5 9.1 ± 0.3 , z2 11.7 ± 0.5 , z4 14.9 ± 0.4 , z5 10.2 ± 0.3 , Z1 11.2 ± 0.2 , Z4 20.8 ± 0.4 , Z5 50.3 ± 1.0 , s4 15.9 ± 0.5 , S2 13.1 ± 0.4 , S4 11.8 ± 0.4 , S5 12.5 ± 0.3 , r3 14.2 ± 0.3 , R1 11.4 ± 0.2 , JV5 19.0 ± 0.3 , macrosetae on leg IV: genu 8.9 ± 0.3 , tibia 14.4 ± 0.3 , basitarsus 27.6 ± 0.5 .

Specimens examined. Three ♀♀ & 5 ♂♂, Mt. Seonun, Kochang, Chonbuk, 19-VIII-1988 (M.-O. RYU leg.), on *Castanea crenata* SIEB. et ZUCC.; 2 ♀♀, Mt. Seonun, Kochang, Chonbuk, 19-VIII-1988 (M.-O. RYU leg.), on *Meliosma myriantha* SIEB. et ZUCC.; 2 ♀♀, Mt. Seonun, Kochang, Chonbuk, 25-VII-1990 (M.-O. RYU leg.), on *Carpinus tschonoskii* MAXIM.; 1 ♂, Mt. Seonun, Kochang, Chonbuk, 25-VII-1990 (M.-O. RYU leg.), on *Corylus heterophylla* FISCH.; 3 ♀♀ & 4 ♂♂, Mt. Seonun, Kochang, Chonbuk, 25-VII-1990 (M.-O. RYU leg.), on *Prunus serrulata* LINDLEY var. *spontanea* (MAXIM.) MAKINO.

Remarks: *Amblyseius quaesitus* was previously recorded from the U.S.S.R. (Primorsky Territory) and China (Hubei Province, as *repletus*).

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摘 要

韓国産の3種のカブリダニが取り扱われた。この中の1種は、新種 *Phytoseius (Phytoseius) koreanus* RYU et EHARA として記載された。また、ソ連の沿海州と中国から知られている *Amblyseius volgini* WAINSTEIN et BEGLJAROV, *A. quaesitus* WAINSTEIN et BEGLJAROV の両種が、韓国から初めて記録され、再記載された。

なお、*A. magnus* WUは*A. volgini*の、*A. (A.) repletus* WU et LI は*A. quaesitus*の、それぞれ同物異名である。

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